

CHAPTER 28

**THE GEOGRAPHICAL INCIDENCE OF LOCAL GOVERNMENT
REVENUES: AN INTRA-URBAN CASE STUDY**

(D Martin, P Longley and G Higgs)

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The geographical incidence of local government revenues: an intraurban case study

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Abstract. The United Kingdom has experienced different local taxation regimes in each of the last three financial years: namely the property-based household rates; the personal community charge or 'poll tax'; and the hybridised personal community charge adjusted for neighbourhood 'transitional relief'. The geographical impact of these changing policies in the Inner Areas of the City of Cardiff is examined, highlighting the importance of historical rateable values and household sizes. By using a purpose-built street-level database, the implications of the different taxation systems are examined at increasingly detailed geographic scales, and the complexity of their impact is illustrated. This analysis focuses upon the geographical effects of using administrative community boundaries for the allocation of transitional relief in Cardiff, Wales.

Introduction

There is presently fierce debate as to the most equitable and efficient means of raising revenue at the local scale (Hills and Sutherland, 1991; McCrone, 1991; Midwinter, 1989). Although the anatomy of a number of different taxation regimes is now broadly understood, there is as yet little detailed understanding of the operation of different regimes at the local scale. Prior to early 1991, stated UK central government policy had been to change from a property-based rating system (based upon notional historical rent levels) to a 'poll tax' or community charge in which a fixed charge is levied against each eligible resident. In practice, this change has proven to be politically unacceptable and, as a consequence, the community charge is being phased out. With effect from April 1993, it will be replaced by a proposed 'council tax' which is to be a hybrid of its property-based and person-based forbears.

The community charge was introduced in two stages: first in Scotland in 1989, and then in England and Wales in 1990. It was intended that the principles underlying the tax would also be phased in, with a system of 'transitional relief' used to cushion the heaviest losers in the transition from the rates: such 'losers' were concentrated in densely populated housing stock, some (but by no means all) of which had low historical rateable values. In practice, the first modest transitional relief arrangements failed to prevent widespread (and sometimes violent) social discontent, and in the second year of the tax more costly and widespread transitional relief arrangements were instituted. In Wales, this variable transitional relief was allocated on the basis of residence within local area 'communities' which were deemed to have lost out in the transition.

In the event, the continued unpopularity of the new tax led central government to a more fundamental reappraisal of local government revenue raising just prior to the implementation of these wider transitional relief measures. Early in 1991, the

decision was made to phase out the community charge, and the subsequent budget in April 1991 sought to minimise the continuing political damage that was attributable to the tax by giving all individuals a £140 reduction in their personal charges. This blanket reduction in charge levels led central government to make good the resultant revenue shortfall by a shift towards indirect (national) taxation, and this was achieved by increasing value added tax (VAT) to 17.5%. The community charge is to continue in this much attenuated and modified form for the 1992/93 financial year pending its replacement. Initial analyses such as that by Burnett (1989) suggested that clear patterns of winners and losers may be expected within many cities, although the situation has since been further complicated by the introduction of the transitional and blanket relief arrangements.

There has therefore been a different basis to local revenue raising in force in each of the last three financial years: 1989/90 was the last year of the old property-based rating system in England and Wales; 1990/91 saw the introduction of the community charge, with only minor adjustments for transitional relief from the rates; and 1991/92 is the second year of the community charge in which there is greater and more widespread transitional relief coupled with a national blanket reduction in personal tax levels which has caused the switch towards indirect taxation. In Wales, the areal basis to the implementation of transitional relief has been an attempt to offset the large increases in payments due from residents of areas which are characterised by high densities of occupation and/or were undervalued by the rating system. These three regimes have each operated alongside often complex arrangements for rebates and exemptions, but we will not consider these in any detail here because these do not influence the guiding principles of any preexisting taxation regimes.

The broad-brush manner in which central government implemented successive local government finance initiatives is likely to have produced spatial patterns of gainers and losers, and indeed the transitional relief arrangements constitute an explicit spatial component to local government revenue raising. In this context, it is lamentable that we have no detailed understanding of the local geography of such taxation systems, particularly in view of the geographical relationship between urban growth patterns and historical rateable values. Moreover, there are indications that plans to implement the new council tax are also being put forward with scant regard to the relationship between property values and built form.

In this paper, we investigate shifts in the geography of revenue raising in Cardiff at a range of spatial scales. We begin by assessing broad shifts between Cardiff's 19th-century urban core (the so-called 'Inner Area'), and the surrounding band of more recent suburban communities. We also estimate the degree to which this redistribution has been countered by transitional relief arrangements between the rating system and the community charge. Next, we examine more detailed shifts within the Inner Area, and similarly evaluate the effects of transitional relief arrangements. Last, we examine the magnitude and pattern of redistribution within selected community areas, and assess some implications for person-based versus property-based taxation regimes. At each stage, we emphasise the pivotal role which geography has played in these recent changes, and flag some issues of import in the most recent shift towards a hybrid council tax.

Data sources and database construction

Part of the reason for the absence of a detailed geographical understanding of local revenue generation is the difficulty in obtaining and managing locationally disaggregate data on eligible individuals and their residences. Specifically, the community charge register remains a confidential document at the level of the individual registrant.

This necessitates the use of imperfect surrogate data, and in our analysis we have used the street-by-street counts of electors from the 1991 electoral register. The electoral register is a publicly available document, but differs from the community charge register in the criteria adopted for the inclusion of certain groups, such as students, service personnel, electoral attainers, and ethnic minority segments of the population (Hoinville et al, 1977). The relationship at the level of the twelve Inner Area communities (including all of the communities which are only partly in the Inner Area) between the number of persons registered on the community charge register and the number on the electoral register is summarised by the following regression equation:

$$C = 375 + 0.864 E, \quad (1)$$

(0.069)

$$R^2 \text{ (adjusted)} = 93.4\%,$$

where C is the number of persons recorded on the community charge register, E is the number of persons recorded on the electoral register, and standard deviation of parameter estimate is given in parentheses. This suggests quite a high correspondence between the two data sources, although this should not be taken to imply close levels of correspondence at other, specifically disaggregate, scales (Fotheringham and Wong, 1991). The highest negative residuals are for the Cathays area of the city, which is characterised by a high student population and an above average concentration of ethnic minority groups. More generally, it should be noted that the community charge and electoral registers will both be subject to an unknown degree of failure to register, and that they only provide annual snapshots of a highly dynamic situation of migration, ageing, and deaths (OPCS, 1991).

The basis to property rating ('rateable values') is the rate register, which in the case of Cardiff, has been continuously updated to accommodate the results of even very recent appeals against assessment. We have used the most up-to-date register of domestic properties in Cardiff. Each property has a unique property reference number which incorporates its street and community identifiers (see below). It does not, however, include properties built since the inauguration of the community charge in April 1990.

Electoral registers for urban areas are organised by street, whereas the rates register contains an entry for each separately rated hereditament. In order to achieve linkage between these two lists, we have aggregated entries in the rates register by street, and entered the street records from both files into a spreadsheet. In our principal study area (defined below), a satisfactory link cannot be made for forty-four street records, accounting for only 0.72% of the total population, for one or more of the following reasons. First, some new streets have been created since the rates register became obsolete. Second, the rates register contains some subdivisions of streets (for example, blocks of flats and maisonettes) which are not distinguishable from the summary electoral register, or which are not liable to rates (for example, hospital and hostel accommodation). Third, there is evidence of some inconsistency in street names between the two registers. A number of street codes present in both lists contain only a very small number of properties and electors. Additionally, twenty-six properties (0.05%) appear in the rates register but not in the electoral register, and this may be a result of demolition since the cessation of the rates register or inclusion of nonresidential properties. Summary statistics for the principal study area are presented in table 1.

The 'Inner Area' has been identified by Cardiff City Council as a convenient unit for various aspects of urban policy, and this areal classification serves to define the boundary of our study area. 'Communities' are the basic areal accounting unit

for collection of both the rates and the community charge and, in a departure from practice in England, also constitute an *areal* framework for the implementation of transitional relief arrangements. Each 'community' in Cardiff's Inner Area is also an electoral ward, with the exception of Castle and Cathays communities, which have been combined to form a single electoral ward. In England the transitional relief arrangements have been instituted at the level of the individual household, and problems of data confidentiality make it much more difficult to model spatial patterns of gain and loss. Within Inner Area communities, the Council has identified 'House Condition Survey' (HCS) areas, which were chosen for their high degree of internal homogeneity of the dwelling stock (Keltecs, 1989). The eighty-one HCS areas aggregate precisely into communities, but the Inner Area is an amalgam of twelve whole or part communities. These relationships are shown in figure 1.

There are problems in assigning streets unambiguously into these areal units. Each street code contains a reference to a community, but many streets traverse two or more HCS areas and communities. In these cases, the aggregate scores for the street have been divided equally between the relevant areas. All of the measures that are referred to in this paper have been calculated on a street-by-street basis. The resulting database allows modelled aggregation to all of the scales of analysis to which we have referred.

The central intention of this paper is to quantify differences in household and individual revenue raising under the rating system and under the community charge during the period of transition between these two regimes. It has been necessary for us to estimate rates poundages which correspond to the community charges as actually levied for the financial years 1990/91 and 1991/92. The information we require is: (a) community charge per person 1990/91, allowing for minor transitional relief in two Inner Area communities; (b) the domestic rate poundage which would have been required under the previous rating system in order to generate the same total revenue for the city; (c) community charge per person 1991/92, allowing for more widespread transitional relief and the blanket reductions announced in the

Table 1. Dwellings, households, and residents in the Inner Area of Cardiff.

Community ^a	Number of domestic properties ^b	Total rateable value (£) ^b	Number of households ^c	Number of electors ^c	Community charge payers ^d
Adamsdown (1)	3307	357 224	3559	5656	5549
Butetown (2)	1647	245 855	1808	2445	2619
Canton (3)	5791	873 152	5869	10552	10195
Castle	189	36 144	234	306	299
Cathays (4)	4489	551 165	5014	10108	7689
Gabalfa (5)	2183	340 940	2180	4785	4111
Grangetown (6)	5100	695 484	5387	9233	9397
Llandaff (7)	3821	802 452	3730	6772	6261
Plasnewydd (8)	6706	854 375	7206	12133	10503
Riverside (9)	5432	715 320	5724	9468	9382
Roath (10)	4288	873 211	4385	9905	7743
Splott (11)	4425	543 592	4550	7980	7945
Inner Area	47 378	6 888 914	49 646	89 343	81 693

^a Numbers in parentheses refer to labels on figures 2-3.

^b Data taken from rates register.

^c Data taken from electoral register.

^d Students are excluded.

1991 budget; and (d) the corresponding domestic rate poundage to raise the same total revenue as in (c).

This information was generated as follows. We obtained from published sources the total community charge revenue for both of the years in question, and also the total domestic rateable value for the entire city. From this, it was possible to calculate the rates poundage which would have had to have been levied upon domestic properties in order to generate the same total revenues. These estimates suggested a domestic rate poundage of 265.2 for 1990/91 and 128.4 for 1991/92: these figures compare with an actual domestic rate poundage of 221.9 levied in 1989/90. These are necessarily crude and provisional estimates of rate poundages, but nevertheless represent a 'best estimate' from the aggregate information available to us. It should also be noted that all of these estimates are based upon the population figures contained in the 1991 electoral register. Our analysis also inevitably fails to accommodate a number of distortions to the alternative systems (such as spatial patterns of rebates and the distribution of students who are liable to just 20% of the full charge), and these were deemed to lie beyond the scope of the present paper.

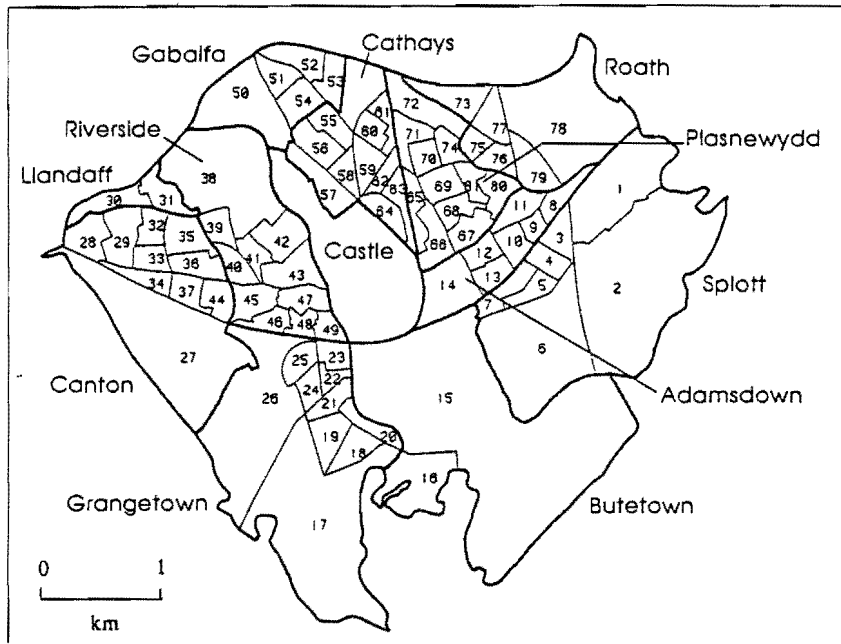


Figure 1. Inner Area communities and House Condition Survey (HCS) areas.

The changing intraurban distribution

Although the spatial focus of this paper is upon the pattern of redistribution within the Inner Area, it is first necessary to understand the broader pattern of change at a city-wide scale. The city itself is the basic unit for which levels of local revenue raising are set by central government. The Inner Area is defined primarily in terms of age of dwelling stock, and overwhelmingly comprises late 19th and early 20th century terraced dwellings of traditional construction. The (residual) Outer Area, by contrast, includes lower density interwar and postwar private housing and a number of extensive estates developed by the local authority. There are thus considerable differences between the Inner and Outer Areas in terms of dwelling age and type, consequent differences in the distribution of rateable values, and differences in household size and composition.

We have calculated the changing percentage contribution of the Inner Area to total revenues over the period 1989-91 as follows.

(a) The actual domestic rate poundage for 1989/90 was multiplied by the rateable value of all properties in the Inner Area, and expressed as a percentage of the known total domestic rates revenue for the city. This reveals that in 1989/90 the Inner Area should have raised 35.7% of the total city domestic rate revenue.

(b) For 1990/91 we multiplied the individual community charge (after adjusting for a small amount of transitional relief for two communities) by our estimate of the charge-paying population of the Inner Area and expressed this as a percentage of the published total community charge to be raised by the city. This reveals that in 1990/91 the Inner Area should have raised approximately 39.4% of the total city community charge revenue.

(c) For 1991/92 we followed the same procedure as in (b), but allowed for the greater and more variable levels of transitional relief allowed to Inner Area communities in this period, as well as the blanket reduction in personal charge levels across the nation. This reveals that in 1991/92 the Inner Area should have raised approximately 29.3% of the total city community charge revenue.

Clearly, therefore, the initial shift from a property-based rating system to a personal community charge entailed a substantial increase in the relative contribution of the Inner Area to city revenue. This reflects the higher occupational density and lower historical rateable values characteristic of such inner-city areas. Subsequent policy sought to reduce this imbalance through the application of transitional relief to all but three of the Inner Area communities. However, following the budget of April 1991, it transpired that the implementation of this transitional relief was coincident with the uniform national reduction in community charges of £140 per person. Although the transitional relief regime alone would have gone some way towards cancelling out the shift that had taken place in the previous year, in the event the £140 reduction was a much more significant factor in the redistribution of the relative tax burden. The relative contribution of the Inner Area actually fell below 1989/90 levels, largely as a result of this absolute reduction in local taxation. In the following section, for reasons of brevity we have not investigated the spatial pattern of revenue raising that would have prevailed with transitional relief but without the blanket reduction.

The geography of three different local taxation regimes

In this section we investigate the pattern of revenue raising under the rates system, the community charge in its original form, and the community charge after modification for national reductions and extensive local transitional relief. The rating system was essentially a tax on property, and the rates paid on most dwellings can be identified with separate households. The community charge is primarily a form of flat-rate personal taxation, with the exception of dwellings which are second homes, in which cases it constitutes a surrogate property tax. The effect of the widespread introduction of transitional relief is to make the community charge more of a hybrid tax, because levels of personal payments are tempered by property characteristics as encapsulated in rateable values. As in the previous section, we have chosen to compare these tax regimes by describing the amounts which households pay before any rebates and allowances.

In order to allow comparison between different maps, figure 2 shows the values standardised by means of a simple Z-score. For example, a score of +2 represents two standard deviations above the Inner Area mean. (The two unshaded areas in all of the maps contain no domestic properties.) It should be noted that residential densities vary considerably across the Inner Area because of the manner in which

residential neighbourhoods were originally developed, and the way in which such areas were interspersed with other land uses. This results in the populations of different areas having disproportional visual impacts on the map (Martin, 1989).

Figure 2(a) illustrates the distribution of notional rates revenue per household for the year 1990/91 which would have been required to provide the Inner Area contribution to city revenue which was actually generated by the community charge. The shading reflects the distribution of domestic rateable values in the Inner Area, and as such is independent of the particular rate poundage levied in any year. The lowest standardised scores are concentrated in the communities comprising the oldest and most modest dwelling stock, that is, Adamsdown, Cathays, and Plasnewydd. Highest standardised scores pertain to the more substantial properties in Roath and Llandaff. Higher than average scores are recorded for Butetown and Grangetown. In the case of Grangetown, this reflects the prevalence of large traditional dwellings, whereas in the case of Butetown, this reflects the higher rateable values of housing that was redeveloped in the 1960s. Taken together, then, figure 2(a) provides evidence of contiguity of similar standardised scores: however, the patterning of rates payments is only imperfectly captured by the boundaries of the named community areas.

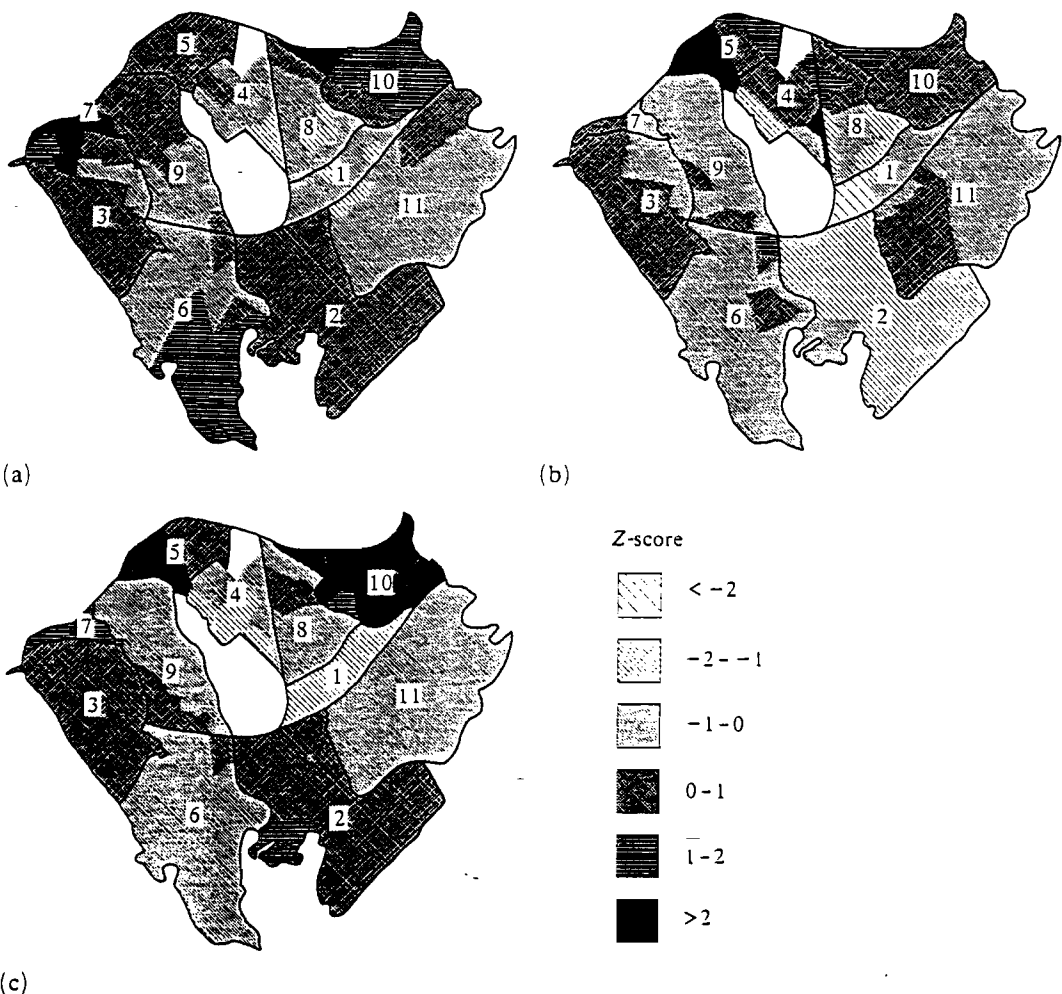


Figure 2. (a) Notional rates (1990/91), (b) community charge (1990/91), (c) community charge (1991/92), per household—standardized scores.

The community charge map for the same period shows a very different distribution of scores [figure 2(b)], standardised relative to the (higher) Inner Area mean charge. The more affluent areas of Roath and Llandaff which would have paid most under the rates are now only slightly above the Inner Area mean score, whereas parts of Cathays, previously in the tail of the distribution of rateable values, now fall in the highest household charge band. This reflects the high residential densities characteristic of smaller properties with historically low rateable values. This trend is apparent despite a modest transitional relief allowance in Cathays (£5 per capita) and Adamsdown (£9 per capita) during 1990/91. Another area which is amongst the highest per household charge payers is Gabalfa, an area of local authority housing, with a large mean household size. The communities of Butetown and Grangetown fare rather better, as a consequence of the smaller mean household size in these areas. There is still clustering of similar values of the standardised score, although the pattern and ordering are quite different to those of figure 2(a).

Figure 2(c) illustrates the pattern of household community charge payments in 1991/92 following the dual impacts of areal transitional relief arrangements and the national reduction in the scale of the charge. The community-based transitional relief has the effect of imposing a considerable degree of within-community homogeneity of the taxation burden which is not present in either of the previous maps. The ordering of communities is largely a reflection of the size of transitional relief allowances. Remaining variations are the result of differences in mean household size in certain subareas. Adamsdown and part of Cathays are liable to the lowest charges per household, whereas in the absence of transitional relief, Roath households pay a relatively high charge.

Perhaps the most important feature of figure 2 is the lack of similarity in the patterning of revenue raising. A pattern based upon a dwelling attribute (rateable values) was replaced first by a pattern which reflects a social characteristic of neighbourhoods (household size), and second by a rather arbitrary administrative classification (community transitional relief). The geography of the community charge revealed here is broadly in accord with preliminary ward-level analyses of Glasgow (Paddison, 1989) and Portsmouth (Burnett, 1990) but tends to suggest a more complex pattern of intraurban variation. In order to investigate the financial implications of these changes upon residents, it is instructive to examine the pattern of 'gainers' and 'losers' during this transitional period.

Patterns of change within the Inner Area

Figure 3 illustrates the differences between the rates and community charge. We have calculated the differences between rates and each of the community charging systems for both households and individuals, and subsequently ranked all the HCS areas for each. This ranking has been used to define 'gainers' and 'losers' in terms of quintile groupings, with group 1 containing the 20% of areas which lose most heavily, and group 5 the 20% which gain most from the transition from the rates system. The absolute sums differentiating these quintile categories at the HCS level are substantial, both before and after the uprating of transitional relief levels and reduction in charge levels: relevant descriptive statistics are shown in table 2. This shows that, although absolute levels of taxation fell over the 1990-92 period, there remains a high degree of variation between the HCS areas.

Each of the parts of figure 3 shows very considerable within-community variation in the pattern of gainers and losers, particularly if we bear in mind that the inclusion of only part of two communities (Llandaff and Roath) is likely to obscure the full variation in these areas. The maps for liabilities in 1990/91 [figures 3(a) and 3(b)] show a high level of conformity between the experiences of

households and the adult individuals within them. However, there is remarkable variation in the experiences of residents of neighbouring HCS areas within most Inner Area communities: the distribution of gainers and losers is spread over four or five of the quintiles within each of no fewer than seven of the nine complete Inner Area communities. Only two complete Inner Area communities show any systematic patterns, in that Butetown and Canton may both be seen to have gained from the switch from the rates to the community charge: this probably reflects the comparative homogeneity of the more highly rated new dwellings in the case of the former, and the predominance of large and possibly underoccupied dwellings in the latter. The inevitable conclusion, however, is that there is no widespread evidence of systematic patterns of gains and losses at the community level, and that the levels of within-community variation are generally as high as those between communities.

In view of this finding, it is scarcely surprising that the introduction of transitional relief at the community scale did nothing to systematise the heterogeneous pattern of gainers and losers. Figures 3(c) and 3(d) reveal that, following the introduction of

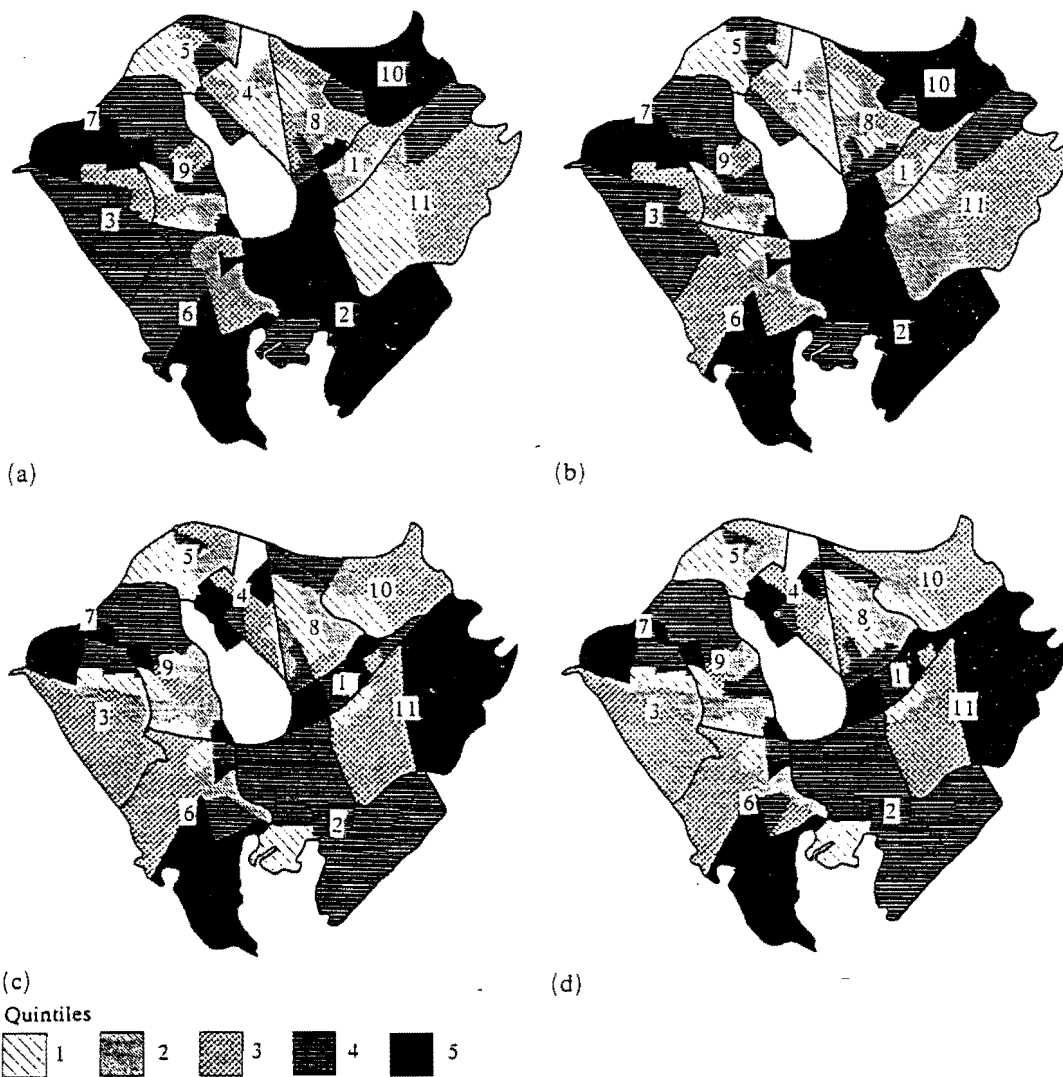


Figure 3. Difference between notional rates and community charge (1990/91) (a) per household, (b) per individual, and difference between notional rates and community charge (1991/92) (c) per household, (d) per individual.

this relief, the within-community spread of gainers and losers extended across all five categories in no fewer than five of the eleven administrative areas, whether calculations are based upon households or individuals. Household calculations suggest that four additional communities (three if we use calculations based upon individuals) span four of the quintiles. In only two of the eleven Inner Area whole or part communities is there systematic evidence of gain (in the case of Adamsdown) or loss (in the case of Llandaff) following the modification.

Taken together, it is apparent from these results that the blunt instrument of community-wide transitional relief has done nothing to rectify emergent changes in the local areal burden of taxation within the Inner Area of Cardiff. In effect, an identifiable pattern of rateable values which did not directly correspond with administrative communities has been replaced by a random arrangement of gainers and losers under the transitional relief arrangements. Indeed, the patterning in figure 3 is sufficiently haphazard to raise the question as to whether even the disaggregation into eighty-one HCS areas is sufficient to capture the true extent of variation. In the next section, we will begin to address this by examining the degree of street-level variation in gainers and losers within two Inner Area communities.

Table 2. Absolute variations in local tax bills between Housing Condition Survey areas, 1990-92.

	Minimum	Maximum	Standard deviation
<i>(a) 1990/91</i>			
Notional rates			
household	231	815	111
elector	85	468	61
Community charge			
household	297	738	62
elector	244	253	3
Difference ^a			
household	-444	374	115
elector	-163	215	60
<i>(b) 1991/92</i>			
Notional rates			
household	112	396	54
elector	41	227	30
Community charge			
household	63	293	49
elector	51	137	24
Difference ^a			
household	-49	184	40
elector	-27	116	23

^a Differences are expressed as rates minus community charge.

Street-level variation in the level of payments

Given that the community scale appears too coarse to capture variations in neighbourhood type adequately, it is tempting to consider whether the smaller policy-based HCS areas provide a more appropriate neighbourhood classification. Riverside and Cathays, two of the heterogeneous communities from figure 3 were selected for an analysis of street-level variations within HCS areas. Calculations were made for notional rates and community charge levies for each street, and the variations within each of the constituent HCS areas are displayed as multiple boxplots in figure 4(a) (Riverside) and 4(b) (Cathays). The variable displayed in each case is the notional rates minus the community charge per person for 1990/91.

These distributions represent mean personal gains and losses per street, and are directly determined by historical rateable values. Although all HCS areas in Riverside and Cathays were 'losers' under the 1990/91 charge, the effect of transitional relief and lower charges in 1991/92 resulted in almost all HCS areas being net gainers from the transition from the rates.

The individual boxplots that constitute figure 4(a) illustrate the variation within numbered HCS areas. Most of Riverside historically developed on a leasehold basis from the Bute estate, although the Romilly estate became the only freehold building ground in the town (Daunton, 1977). Although uniformity of development was the norm for the Bute estate, there developed considerable diversity in the size and character of houses erected in the neighbouring areas which today constitute HCS areas 39 and 40. This variability is mirrored in the distribution of rateable values, and the difference index in the boxplots. By contrast, HCS area 46 comprises uniform terraced housing and displays much less variation.

Figure 4(b) illustrates that Cathays community displays greater variation within and between HCS areas. The most extreme HCS area (57) includes a development of purpose-built flats in the city centre which are big gainers: elsewhere individuals are resident in homogeneous streets with low variation in rateable values (areas 62 and 63).

In each of these cases, a certain amount of variation and some outliers may be expected because of the physical design and layout of the streets. None of these areas is entirely internally homogeneous, and may contain features such as individual blocks of redeveloped property. Also, some of the streets in the database will traverse two or more HCS areas, and therefore the mean street value will contribute to both area scores. This will have the effect of reducing the variation observed between some adjacent areas. The absolute variation in all areas in 1991/92 is considerably reduced compared with the previous years, because of the large reduction in the amount paid by each individual.

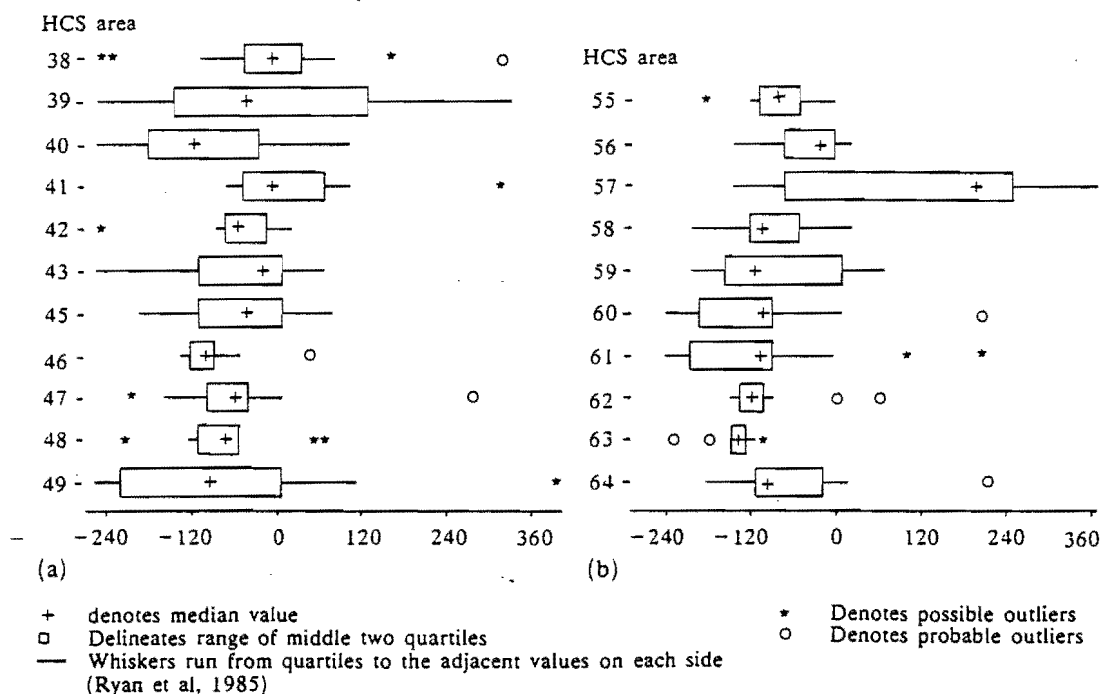


Figure 4. Multiple boxplot of difference between notional rates and community charge per person; (a) Riverside, (b) Cathays House Condition Survey (HCS) areas.

Conclusions

It is beyond doubt that the UK local taxation system remains in a state of flux following the initial switch between two radically different taxation regimes and the subsequent belated attempt to reconcile them through transitional relief arrangements. Most of the British electorate has now experienced three different regimes in as many years, and our analyses suggest that very many households, in Cardiff at least, have made very different relative local tax contributions under each of these. These experiences have come about fundamentally because a local historical geography of property rateable values bore little correspondence to the microscale distribution of residents in the city. Furthermore, the reconciling mechanism, transitional relief, was cast within an inappropriate administrative areal classification, which served only to fragment and blur the pattern of winners and losers rather than generating similar experiences amongst households in adjacent areas. Although we have not done this, we would anticipate a similar conclusion had we allowed for the pattern of individual rebates and allowances which can be offset against rates and community charge demands. In short, our calculations suggest that an historically quixotic pattern of household rates liabilities has been superseded by a different, but similarly variable, pattern of household community charge bills.

In the short term, the 1991 switch towards indirect taxation can generate the illusion that all Cardiff residents are 'gainers'; in the longer term, however, any serious attempt to reinstate the pre-1991/92 levels of local taxation may carry with it potential political dangers consequent upon the fact that most local residents are likely to have fared better under at least one of the previously discarded measures.

Within Cardiff, this has come about because of the use of inappropriate, coarse administrative units for the transitional relief arrangements. In future papers we hope to undertake a more detailed investigation of the impact of scale and zoning problems (Fotheringham and Wong, 1991) in our study area and we hope to build a more spatially detailed surface of gainers and losers under the changing arrangements. In substantive terms, we also intend to extend our analysis in order to anticipate the revaluation of all properties on a capital-value basis (Wyatt, 1983), in order to visualise the likely patterns of gainers and losers in heterogeneous areas under both the council tax and fair rates scenarios. For the moment, our preliminary results provide a timely reminder that the so-called modifiable areal unit problem (see, inter alia, Openshaw, 1984) can have a profound effect upon public policy, and that even the street level of aggregation (as proposed as the basis for future council tax valuations) can mask considerable heterogeneity in terms of household characteristics and dwelling attributes.

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